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ABSTRACT

This study is the sixth in a series of reports from the Reading-to-Write Project, a collaborative study of students' cognitive processes at one critical point of entry into academic performance. This report provides an in-depth look at how students use elaboration (bringing prior knowledge to a task), how much value elaborative material adds, and how the material generated via elaboration during reading affects the essays students write. Subjects, 17 college freshmen enrolled in a freshman composition course, wrote an essay about time management, had their think-aloud protocols recorded, and were interviewed. Results indicated that the subjects elaborated abundantly as they read, selecting or discarding source text ideas, forging connections between previously disparate concepts, and creating hierarchies of importance. Results also indicated that while elaborative material in the form of ideas and examples rarely transferred directly into the students' own texts, elaboration had an important indirect influence, shaping the content and structure of the essays in a number of ways. (The Reading-to-Write study reference list is attached.) (RS)

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Technical Report No. 25

ELABORATION: USING WHAT YOU KNOW

(Reading-to-Write Report No. 6)

Victoria Stein

May, 1989

This Report will appear as a chapter in *Reading-to-Write: Exploring a Cognitive and Social Process*, by Linda Flower, Victoria Stein, John Ackerman, Margaret J. Kantz, Kathleen McCormick, and Wayne C. Peck, to be published by Oxford University Press. An overview of the Study to which this Report refers can be found in CSW Technical Report No. 21, *Studying Cognition in Context: Introduction to the Study*.

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Preface to the Reading-to-Write Reports

> So I'm just gonna--I don't care, I'm just going to interpret them the only way I can interpret them. . . . Let's just put what the authors agreed on. *Authors agree* -- We'll just -- If at least two of them concur, we'll say they agree. *Authors in general agree that*. . . . But then they don't agree -- There's nothing you can say about this. . . .
>
> Can I leave it at that. . . . Oh give me a break, I don't know what I'm doing. I'm only a freshman. I have no idea what to do.
>
> Darlene, a first-semester freshman

Darlene's college assignment asked for synthesis and interpretation. The paper she turned in--a short, simplistic review of material from her sources--failed to meet her own expectations and her readers'. And yet, a chance to look at the process behind this unsophisticated product revealed serious thinking, a complicated, if confused, decision process, and a trail of unused abilities and discarded ideas--an active encounter with academic discourse that her teacher would never see.

The study presented here takes an unusually comprehensive look at one critical point of entry into academic performance. It shows a group of freshmen in the transition into the academic discourse of college, looking at the ways in which they interpret and negotiate an assignment that calls for reading to write. On such tasks, students are reading in order to create a *text* of their own, trying to integrate information from sources with *ideas* of their own, and attempting to do so under the guidance of a *purpose* they must themselves create. Because these reading-to-write tasks ask students to integrate reading, writing, and rhetorical purpose, they open a door to critical literacy. Yet this same interaction often makes reading-to-write a difficult process for students to learn and to manage.

In order to get a rounded picture of cognition in this academic context, the study looks at the thinking processes of these students from a number of perspectives, drawing on think-aloud protocols of students writing and revising, on interviews with and self-analyses by the students, and on comparisons of teachers' and students' perceptions of texts the students wrote. It attempts to place these observations within a broader contextual analysis of the situation as students saw it and the social and cultural assumptions about schooling they brought with them.

What this study revealed were some radical differences in how individual students represent an academic writing task to themselves--differences which teachers might interpret as a simple indication of a student's ability rather than a student's interpretation of the task. The students were often unaware that such alternative representations existed or that they might hold such significance. Some images of the task, for instance, such as those dominated by the goals of comprehension, summary, and simple response, offered little or no place for critical response, original synthesis, or interpretation for a rhetorical purpose.

The reading-to-write task students imagined for themselves also had a direct effect on performance: it affected the goals they set, the strategies they used, and the

ways they solved problems during composing. And it led to differences in teachers' evaluations of the texts--although, this study suggested, these evaluations may confuse the conventions of organization (e.g., use of topic sentences) with the writer's control of ideas. When students began to examine their options and attempt the more demanding task of interpreting for a purpose, certain students, whom we called the Intenders, showed important changes in their writing and thinking process. These changes, however, were not evident in the text and nor apparent to teachers. Finally, this study showed how students' images of the task were rooted in the students' histories, the context of schooling, and cultural assumptions about writing which they brought to college.

It is not surprising to find that some of the images students bring with them are at odds with the expectations they encounter at a university. However, when the expectations for "college-level" discourse are presented in oblique and indirect ways, the transition students face may be a *masked* transition. That is, the task has changed, but for a number of reasons, the magnitude and real nature of this change may not be apparent to students, even as they fail to meet the university's expectations.

One of the key implications of this study is that reading-to-write is a task with more faces and a process with more demands than we have realized. We see students thinking hard and doing smart things, even when they misgauge their goals or their written text fails to meet certain standards. This close survey of the cognitive and social landscape of reading-to-write in a college class gives one added respect for the students in this transition and for the complexity and sophistication of the "freshman" task as they face it.

The Reading-to-Write Project was carried out as a collaborative effort at the Center for the Study of Writing, at Carnegie Mellon. We designed the study to create a range of alternative perspectives on the process of reading-to-write and on the way cognition is shaped by the social context of school. The following technical reports present the design and collaborative history of the study; analyses of the cognitive processes we observed, of the texts, and of students' perceptions of both; and a set of conclusions, from different theoretical perspectives, on how students manage this entry into academic discourse:

Reading-to-Write Report 1. **(CSW Tech. Report 21)**	**Studying Cognition in Context: Introduction to the Study.** **Linda Flower**

Reading-to-write is an act of critical literacy central to much of academic discourse. This project, divided into an Exploratory Study and a Teaching Study, examines the cognitive processes of reading-to-write as they are embedded in the social context of a college course.

Reading-to-Write Report 2. **(CSW Tech. Report 6)**	**The Role of Task Representation in Reading-to-Write.** **Linda Flower**

The different ways in which students represented a "standard" reading-to-write task to themselves led to marked differences in students' goals and strategies as well as their organizing plans. This raised questions about the costs and benefits of these alternative representations and about students' metacognitive control of their own reading and writing processes.

Reading-to-Write Report 3. (CSW Tech. Report 22)

Promises of Coherence, Weak Content, and Strong Organization: An Analysis of the Student Texts. Margaret J. Kantz

Analysis of students' Organizing Plans (including free response, summary, review and comment, synthesis, and interpretation for a rhetorical purpose) also revealed a hybrid plan in which certain coherence conventions gave the promise of synthesis while the paper's substance reflected a simpler review and comment strategy. Both students and teachers, it appeared, may sometimes confuse coherence strategies (for text) with knowledge transformation strategies (for content).

Reading-to-Write Report 4. (CSW Tech. Report 23)

Students' Self-Analyses and Judges' Perceptions: Where Do They Agree? John Ackerman

Any writing assignment is a negotiation between a teacher's expectations and a student's representation of the task. Students' Self-Analysis Checklists showed a strong shift in perception for students in the experimental training condition, but a tellingly low agreement with judges' perceptions of the texts.

Reading-to-Write Report 5. (CSW Tech. Report 24)

Exploring the Cognition of Reading-to-Write. Victoria Stein.

A comparison of the protocols of 36 students showed differences in ways students monitored their comprehension, elaborated, structured the reading and planned their texts. A study of these patterns of cognition and case studies of selected students revealed both some successful and some problematic strategies students brought to this reading-to-write task.

Reading-to-Write Report 6. (CSW Tech. Report 25)

Elaboration: Using What You Know. Victoria Stein

The process of elaboration allowed students to use prior knowledge not only for comprehension and critical thinking, but also for structuring and planning their papers. However, much of this valuable thinking failed to be transferred into students' papers.

Reading-to-Write Report 7. (CSW Tech. Report 26)

The Effects of Prompts Upon Revision: A Glimpse of the Gap between Planning and Performance. Wayne C. Peck

Students who were introduced to the options of task representation and prompted to attempt the difficult task of "interpreting for a purpose of one's own" on revision were far more likely to change their organizing plan than students prompted merely to revise to "make the text better." However, the protocols also revealed a significant group of students we called "Intenders" who, for various reasons, made plans they were unable to translate into text.

Reading-to-Write Report 8. (CSW Tech. Report 27) — **Translating Context into Action. John Ackerman**

One context for writing is the student's history of schooling including high school assignments and essays. Based on protocols, texts, and interviews, this report describes a set of "initial reading strategies" nearly every freshman used to begin the task--strategies that appear to reflect their training in summarization and recitation of information. From this limited and often unexamined starting point, students then had to construct a solution path which either clung to, modified, or rejected this a-rhetorical initial approach to reading and writing.

Reading-to-Write Report 9. (CSW Tech. Report 28) — **The Cultural Imperatives Underlying Cognitive Acts. Kathleen McCormick**

By setting reading-to-write in a broad cultural context we explore some of the cultural imperatives that might underlie particular cognitive acts. Protocols and interviews suggest that three culturally-based attitudes played a role in this task: the desire for closure, a belief in objectivity, and a refusal to write about perceived contradictions.

Reading-to-Write Report 10. (CSW Tech. Report 29) — **Negotiating Academic Discourse. Linda Flower**

Entering an academic discourse community is both a cognitive and social process guided by strategic knowledge, that is, by the goals writers set based on their reading of the context, by the strategies they invoke, and by their awareness of both these processes. As students move from a process based on comprehension and response to a more fully rhetorical, constructive process, they must embed old strategies within new goals, new readings of the rhetorical situation. However, for both social and cognitive reasons, this process of negotiation and change that academic discourse communities expect may not be apparent to many students for whom this becomes a confusing and tacit transition.

Reading-to-Write Report 11. (CSW Tech. Report 30) — **Expanding the Repertoire: An Anthology of Practical Approaches for the Teaching of Writing. Kathleen McCormick *et al.***

One important implication of this entire study is that students themselves should come into the act of examining their own reading and writing processes and becoming more aware of cognitive and cultural implications of their choices. This set of classroom approaches, written by teachers collaborating on a Reading-to-Write course that grew out of this project, introduces students to ways of exploring their assumptions and alternative ways of represent aspects of the task.

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ELABORATION: USING WHAT YOU KNOW

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In the previous report, we explored the broad landscape of the cognition of reading- to-write, focussing on four cognitive processes: Monitoring, Elaboration, Structuring and Planning. This report provides a more in-depth look at one of these processes, namely elaboration, which is the process by which students bring their own knowledge into the task. Students and teachers alike place a high value on "using what you know." Students see it as an expert move (see Report 4). Traditionally, teachers have often taught students to write what they know about. As is evident from Figure 1 in the previous report, it is the process the students in our study used most often, regardless of the kind of paper they wrote. In this report, we will look at the many and varied uses of prior knowledge in reading to write, and the effect that importation of this kind of knowledge has on performance of the task.

In discussing invention and discovery, Booth and Gregory (1987) wrote of the primacy of memory in the writing process: "Our memory is...stocked with ideas, feelings and experiences... On any given writing occasion only a few of these memories will be useful, but every piece of writing can be filled out or deepened to some extent by memories... Most often, perhaps, we use memory simply to provide vivid details or images in support of points found in other topics. But often enough memory can provide just what we need--if only we can learn how to tap it."

This quotation highlights an important assumption that underlies both current reading and writing theory: that people, whether engaged in reading or writing activity, use what they already know of the world to help make meaning. Reading theorists of diverse perspectives, such as Just and Carpenter (1986), Bransford (1979), Kintsch and van Dijk (1978), and Schank and Abelson (1977), among others, have all noted that comprehension beyond the decoding level cannot occur unless the reader has some form of prior knowledge he can map the new information onto. Similarly, writing theorists representing different schools of thought, such as Langer (1984), Flower and Hayes (1980), Bartholomae (1985) and Elbow (1981), have advocated tapping memory as a fundamental means of invention and of critical thinking. Whether you call it world knowledge, general knowledge (Schank & Abelson, 1977) or episodic knowledge (Tulving, 1972), personal experience or simply "using what you know," one thing is clear: Our understanding of the world affects the way we take in information about it and the way we communicate what we know.

One of the most commonly acknowledged ways that people tap memory is through elaboration, generally defined as the importation of prior knowledge during information processing. For example, a reader may draw an analogy between the actions of a character in a book to someone she knows in real life, thus validating the character's behavior. Similarly, a writer may search memory for relevant examples to include in an argument as a means of gaining agreement from his intended audience. Elaboration's usefulness as an aid to comprehension and retention is well established (cf. Reder, 1980). More recent theory on elaboration suggests that it enables deeper levels of processing, encouraging critical thinking.

But Booth's remark also throws into high relief a dilemma that has long held researchers and teachers in sway: It is not enough to recognize that readers and writers have information stored in memory that can be of use. Reading and writing are, after all, goal-directed processes whose direction and shape change with task demands. We must also therefore understand how a reader or writer gets to appropriate and useful information, and once there, how he can make use of it most advantageously. Moreover, some tasks, including that most common of academic tasks, the reading-to-write task, necessitate the interweaving of reading and writing goals. This leads to more questions. How do people use prior knowledge in such tasks? Do the elaborations students make while reading have an impact on what they will write later on? And do writing goals change the way students read source texts, thus affecting the way they elaborate while reading?

The purpose of the study described in this report was to explore the role of elaboration in reading-to-write tasks. It seeks to answer three questions:

- How do students use elaboration in this process?
- How much value does elaborative material add to source text material?
- How does material generated via elaboration during reading affect the essays students write?

In order to answer these questions, we looked more closely at protocols made by the 17 freshmen described in Report 5. One of the most interesting--and readily apparent--features of all of the protocols we analyzed was that all of our subjects elaborated abundantly as they read. Their elaborations contained a wealth of material that was not found in the source text: examples and counterexamples, instantiations, evaluations, criticisms, embellishments of old ideas and wholly new ideas. Moreover, these elaborations did more than support basic comprehension. They allowed students to select or discard source text ideas, forge connections between previously disparate concepts, and create hierarchies of importance. Surprisingly, however, while elaborative material in the form of ideas and examples rarely transferred directly into the students' own texts, elaboration had important indirect influence, shaping the content and structure of the essays in a number of ways.

THE ROLE OF ELABORATION IN READING-TO-WRITE

In order to understand elaboration's role in the process of reading-to-write, it is necessary to explore the ways in which the reading and writing processes themselves can intersect. Current research sees both processes as constructive, in which readers and writers build "mental representations" of text. This involves selecting, connecting and organizing ideas in such a way as to create a coherent, structured body of knowledge. This view is the basis for the constructive model of reading (cf. Spivey, 1987) which defines comprehension as an interactive process in which readers use both cues from a source text and prior knowledge to create meaning. That is to say, as readers compare information they are reading to what they already know about the topic as part of the comprehension process, they are selecting, connecting and organizing information from both sources to create a new representation of meaning. This new representation may differ in content and structure from the source text because it contains additional information from memory that may have been organized differently.

Elaboration is the principle means by which information from memory is combined with source text material in the reading process. Reder (1980) defines elaboration as "extra processing that results in additional, related or redundant

propositions," i.e. the importation of information not found in the source text to the reading process. Such information serves several purposes: it aids in comprehension by creating context (cf. Reder, 1980; Whitney 1987); it provides redundancy for recall (Reder, 1980); and it provides salient exemplars of ideas found in the source text. However, elaborations have been seen as idiosyncratic, with the ability to lead the reader away from the "correct" meaning of the text (Reder, 1980). In this view, elaboration is seen as a secondary, supportive addition to the reading process (Reder, 1980).

More recent research, however, such as that of Hamilton (1987), Whitney (1987), and Weinstein et al. (1979), finds that purposeful instruction in the process of elaboration aids not only in comprehension and recall, but also facilitates depth of processing and encourages critical thinking. Whitney notes that when readers have a lot of topic-related prior knowledge, the comprehension process involves simply adding new information to already established schemas. However, when readers have no such knowledge to call on, comprehension becomes the process of *constructing* schemas. Elaboration, with its ability to provide context which includes information about objects and concepts and their relations can greatly facilitate this process. Weinstein et al. note that as expert readers apply schematic knowledge, it is likely to contain not only information about structure and relations, but also provide expectations that, when violated, prompt the reader to process more. Thus elaboration does more than simply provide a basis for comprehension or strengthen recall. It enables readers to forge new connections, encourages them to examine texts more critically when expectations are not met, and to find new paths to understanding.

Much of the research done on elaboration and the writing process has focussed on the role of elaborations in written products. For example, the amount of elaboration included in a text is often seen as an indication of writing ability (Benton et al., 1986). Reder et al (1986) have found that writer-generated elaborations, in the form of examples placed in instructional texts, in some instances are not as helpful as reader-generated elaborations, such as analogies to personal experience that is more relevant. Thus writers need to be careful about what kinds of elaborations they include.

It is important, however, to consider the impact of elaboration (as the importation of prior knowledge) on the writing process as well as on its products. Like reading, writing involves the generation of representations of meaning. Flower & Hayes (1984), in their "multiple representation hypothesis," claim that writers generate a number of representations that may grow in purpose, fullness and coherence as ideas develop. Again, the creation of such representations involves the selection, organization and connection of ideas. But the writing process requires that a student translates that private meaning into public utterance. That is to say, the text she produces must not only reflect her understanding of the topic and the world, it must also be shaped so that the reader can draw on shared knowledge to get the author's point as she intends it. These two goals--to say what is meant and to make that meaning accessible--and the processes that support them--invention and audience adaptation--shape the representation of meaning as surely as schemas affect the creation of meaning during reading. As the writer invents meaning, he draws on his experience of the world to indicate what he believes to be most important to write about. As he adapts his prose for an audience, he draws on stores of shared knowledge and experience--e.g., knowledge of text structure conventions, of specific people in his audience, of experience with the world, of rhetorical commonplaces and so on--to build a representation of meaning that guides the reader toward his intent. In this way, knowledge and goals interact to create meaning.

In the context of reading-to-write tasks, the role of elaboration in these processes merits attention because of the way elaborations made during reading shape text. As the student elaborates during the reading process, she is creating a pool of ideas from which to draw during the writing process. This pool is to a large degree custom built by the student, who selects ideas from the source text and from memory and arranges them on the basis of what makes sense to her. To some extent, then, the selection, organization and connection of ideas that occurs during the reading phase may become the blueprint for what the student will write. The elaborative strategies a student uses while reading, as we shall see, may even become the basis of plans during writing. Similarly, comparison of source text ideas to prior knowledge during reading becomes the basis for invention during writing.

Thus elaboration can provide many opportunities for inventive or critical thinking throughout the reading-to-write process. As this study shows, students take advantage of a good number of these opportunities during the reading and planning stages of the task.

THE PROTOCOL STUDY

The protocols analyzed in this study were those generated by the 17 freshman subjects who thought aloud as they performed the Time Management task, as described in Report 3. One reason that the topic of time management was chosen was because it is one with which most students have had some personal experience. It is a topic freshmen often elect to write about in college composition courses, as they adapt to bigger course loads, more homework and the temptations of life away from home. Also, many freshmen orientation materials and programs center on the need for adequate time management skills in college.

The text these students were given was designed to mimic the kind of research notes they themselves might have generated had we assigned them the task of doing research on time management. Nelson and Hayes (1988) have found that in doing research papers, many students simply more or less randomly pull appropriate books off the shelves, copy out the minimum amount of relevant material onto note cards, and then later copy their notes into their papers. The text on time management emulates such note cards. The six experts on time management whose opinions were cited represented diverse approaches to the topic: one was a psychologist; another was writing a "guide to the intellectual life"; one looked at time management from an adult business perspective, while another looked at time management in academic settings. A survey of students citing their own time management methods was also included. The text included a separate paragraph for each author, which contained several main ideas without embellishment. Paragraphs were separated from each other by rows of asterisks. No effort was made to form coherent or cohesive ties from one paragraph to another.

The students were told to read the text and then write about it. As explained in Report 2, the exact specifications for their essay were left ambiguous because we were interested to see how students represent such tasks to themselves. Instructions included prompts to "synthesize and interpret all relevant findings," "make a statement," "be comprehensive," concluding with an open-ended statement that "we are interested in your ideas."

Our students made an average of 16 elaborations per protocol. Analysis of the elaborations indicated that they served three distinct purposes:

- generation of new ideas
- development of critical perspectives
- further development of ideas already found in the source text.

A look at some of the elaborations our subjects made affords some perspective on these functions:

Generation of New Ideas: One of the most obvious functions of elaboration is the generation of various kinds of additional material, that is information not found in the source text. Much of that material is at the level of detail--for example, an adjective. The goal of this analysis, however, was to capture those elaborations that represent a significant departure from those in the source text, and bring new top-level concepts into consideration. Therefore our coding for this category included only those episodes where new ideas provided an organizational frame or superordinate concept that linked together ideas found in the source text.

Alice used elaborations in this way. She reads a passage that claims that "will power alone can't induce concentration" and that "motivation alone will [not] help students who don't know how to study and don't create a quiet distraction-free environment and don't schedule their time carefully." The author goes on to suggest that students who "schedule as much study time as possible into their days are likely to be better students." Alice responds as follows:

> "Well I also think you need to do other things besides just work or you'll get kind of stale, but we'll get some of his ideas down...[writes] **Will power is not responsible for concentration...distractions disturb your concentration**...and you want to inundate **yourself with study time** and that will give you quality work...But I think that sometimes you work better when you're under pressure and have very little time...but to each his own. . ."

The casual remark "to each his own" eventually becomes the organizing frame for Alice's essay, which begins "Time management takes a different course for various people" and goes on to discuss the importance of finding the mode of time management that is "right for you."

Critical Perspective: In our study, students used elaboration as a means of developing critical perspective more often than any other function. The term "critical perspective" is used here to indicate modes of evaluation. For example, development of critical perspective may come in the form of agreement or disagreement or qualification of an idea, or it may involve an effort to assess the validity or practical application of an idea in the real world. It may also include relevance judgments or an attempt to characterize an idea as conditional. Generally, efforts to apply prior knowledge in this way were signaled by certain kinds of language, such as "if, when, maybe/maybe not, I agree, that's garbage" and so on.

James's protocol provides some good instances of this. For example, while reading one author's advice to ""find a place that is at once calm and stimulating" and "tolerate nothing that is not useful or beautiful, he muses:

> "I think the problem is finding that type of place. It's very difficult. There's...if you study in your room it can be calm and stimulating, but you often find other things to do. The library can be calm and stimulating, but it can be too boring and you don't feel right because there's too many other people studying around you.....Why do you have to have beautiful things to work with? I mean, just because I have a picture from a newspaper that happens to be a Picasso, does that mean that it helps me work? I don't stare at it. I stare at my grades, which are very bad. That's not beautiful. . . ."

Here James, by generating instantiations based on what he knows about work environments, is able to test the assertions of the author. This testing procedure will, in the long run, influence not only the way he perceives this author's ideas, which he finds debatable, but also the way he treats these ideas in his own essay, in which he deals generally with the notion of developing a comfortable working environment, but does not mention this author's ideas at all.

Development: Our students also frequently used elaboration as a means for developing ideas already found in the source text. In other words, they used prior knowledge as a source of examples, counter-examples, metaphors, analogies and low-level connectives that provided context or support for things our experts said about time management. For example, almost all of our subjects, reading the passage that "advocated continued concentration in the face of apparent mental fatigue" which may "get worse up to a certain critical point" but then passes away when "we have tapped a new level of energy" said that this idea reminded them of the concept of "second wind" in sports, an analogy that in some cases made its way into final essays.

More often than not, however, students used elaborations to provide critical perspective and development of ideas in tandem. That is to say, a student might indicate agreement with a source text idea and then provide an example from memory as a means of validating the statement. Or, alternatively, she might provide a counter-example to think through why she disagreed with an idea. For example, Eddie, reading that some students "read material once [and] don't try to remember it until it's needed" says:

> "That depends a lot on what class or what material you're talking about....It depends on which class you're talking about because something like physics, I can read the material once and then be refreshed constantly in recitation or lecture...however, if I'm reading for a quiz, or you know, something where I obviously need to know it and I'm not going to be able to check on it later, I'm going to have to memorize it right away...or, as in Economics, where the teacher is so bad that I had to do it on my own. . . ."

Here Eddie creates critical perspective by conditionalizing an idea and develops his own perspective by providing different examples of when this idea may or may not work in a real world situation. Later, both the notion that the usefulness of this idea "depends" on the circumstance and the actual instances generated by Eddie as he read find their way into his final essay.

Three raters looked at the elaborations generated by these students to see if indeed they allowed students to create new ideas, critical perspective and idea development. They found that 83% of these elaborations functioned as a means of developing critical

perspective, 29% functioned as a means of idea development and 5% provided new ideas.[1] (See Appendix I for notes.)

Clearly the elaborations were affording students the opportunity for deeper processing, but how good were the opportunities? In other words, how good were the new ideas, how useful was the critical perspective for analytical thinking, how much support did the additional development of ideas provide? In order to assess this, raters were asked to perform a quality rating for each elaboration to see how much value the new ideas, critical perspectives and idea development actually contributed to the ideas in the source text. This was called a "Value-Added" rating , with the concept of "value-added" defined as "the extent to which the content of an elaboration enhanced the content of a source text proposition by adding valuable new material." Raters were given a four point scale (0 = no value; 1 = some value; 2 = more value; 3 = great value).

In their estimation, the raters felt that the vast majority of these elaborations added value to the propositions in the source text. Fifty percent were rated as adding "some value." As an example of "some value," consider Michelle. She reads that "students may be breaking concentration whenever they remind themselves that they must use willpower" and says:

> "That makes sense...If you think about it, then you're not gonna be able to do it..It's just like thinking that you shouldn't...if you try not to think about anything, you're always thinking about something. . . ."

This example was rated as having "some value" as further development of a point in the source text.

Twenty-seven percent were rated as adding "more value" to the source text. For example, Fred reads William James's assertion that pushing on in the face of fatigue leads one to a new level of energy and says:

> "I don't know about this. I can relate to using your mental energy and when you're very fatigued and getting worse and worse, then after a point it does seem to get better. But I don't believe it's that you've suddenly found this new energy. I believe you've gotten to a point where you no longer can be concerned with your fatigue. It just doesn't bother you anymore. . ."

The raters deemed this as adding "more value" as critical perspective on the original source text idea. The elaboration conditionalizes the idea in such a way as to lead Fred to reject the author's notion out of hand and to generate his own account of the phenomenon.

Finally, 3% of the elaborations were rated as adding "great value." Eddie's previous consideration of the advice about "reading material only once" is an example of an elaboration rated as having "great value" as critical perspective.

Only 17% of the elaborations were rated as adding no value at all to source text ideas. In other words, over 80% of all elaborations were thought to enhance the meaning of source text ideas by providing valuable new ideas, critical perspective or idea development.[2]

Having established the function and quality of these elaborations, it remained to determine how much of this valuable and useful information found its way into the students' final texts. The same raters were asked to evaluate how much of the elaborative material generated while reading made it into the final texts written by our participants. Another four-point scale was used. This time 0 = no transfer, 1 = some transfer, 2 = rich transfer and 3 = very rich transfer. This scale had two uses. One was to determine whether or not this material got transferred at all. The other was to determine how high in the structure of these texts the ideas were placed if they were transferred. Consequently, "some transfer" was defined as meaning that the information in an elaboration had only the merest mention in the final text. "Very rich transfer" meant that an idea from an elaboration assumed a major position in a student's final text. "Rich transfer" fell somewhere in between.

Results of this rating show that 78% of all elaborative propositions were not transferred to final texts. Of the material that was rated as having transferred, 12% was deemed as having only "some transfer," 7% as having "rich transfer" and 2% as having "very rich transfer."[3] In other words, while 80% of all elaborations made by our participants were rated as having at least "some value" as a new idea, as a means of evaluation, or as support for ideas already in the source text, only 21% showed up in recognizable form in the students' own texts, and most of that was at a low level in the structure of those texts. In interpreting this observation, we might ask if any transfer was indeed needed--and the evidence of the papers suggests it certainly was (see Kantz, Report 3). The essays were simple, underdeveloped in the way freshman essays often are and they violated our strong expectations as academic readers and our request for more analytic thinking in the task instructions. While it may be reasonable to expect that not all elaborative material is worthy of direct transfer, the results of the ratings indicate that more direct transfer could have enhanced these essays.

The fact that so little of this information directly transferred does not, however, mean that the elaborations had no effect on the students' essays.[4] On the contrary, there is evidence to suggest that the elaborations had a clear, albeit tacit, effect on these papers, which we called "indirect transfer." That is to say, elaborations made during reading shaped the way students dealt with source text ideas in their papers.

For example, as we have seen before, elaborations often serve as a means of selecting ideas, which means eliminating some along the way. Also, strong statements of preference for one source text idea over another affected the way in which students created hierarchies of importance in their papers. Finally, we saw that in some instances, elaborative reading strategies eventually became the basis of writing plans along the way.

Suzie's protocol provides an example of the way elaborative reading strategies can metamorphose into writing plans. As she read the source text for the first time, Suzie's main strategy seemed to involve deciding whether she agreed or disagreed with source text ideas. As she rereads the source text, she decides to "put a star next to" all the ideas she agrees with and also decides to write down "the things I agree with--that I can comment on because I agree with..." She decides that she will "put in two different parts in my paper-- the things that I agree with and the things I don't agree with..." Her elaborative strategy reinforced as a plan, she starts applying her own knowledge freely, moving from simple statements of agreement to generation of ideas and examples. When she rereads the passage urging "continued concentration in the face of fatigue," with its "second wind" idea, she notes:

> "OK, I studied that last year in my movement class, where you would work so hard you would be doing tumbles and rolls and handstands and you'd get tired and you'd keep working through your tiredness even though you felt like you were about to die. And you kept working and working and working and all of a sudden you would find a new level of energy. That's true, so I'm going to make that comparison in my paper to my movement class to that exercise...."

Throughout the rest of her reading, she elaborates like this, providing extended examples and counter-examples, always noting what she will use and what she won't use. When she has finished her second reading she says

> "I think I have pretty much all I need to start writing the paper. I have all my notes. I have everything in order. I know what I want to say. I want to compare what I know to what they know, and tell my own opinions on what they said. So I think I'm ready to write the paper now...."

In Suzie's case, a simple elaborative strategy for providing critical perspective--i.e. noting whether or not she agreed with a source text idea--developed into a writing plan--writing about those sources of agreement--that in turn triggered more complex elaborative strategies that she could use in a goal-directed way. In other words, an elaborative strategy became a writing plan, providing a goal structure that influenced the way she read thereafter.

CONCLUSION

This study is basically the story of opportunity gained and opportunity lost. We see that students, without prompting and training, freely and routinely apply what they already know to what they are reading and writing about, and in doing so, generate a wealth of material that in and of itself may have considerable value. Further, we see that the process of elaboration itself has enormous potential to transform, potential that may be too often overlooked by students .

For example, we see that elaboration can lead to invention. The prior knowledge students import contains not only topic knowledge, but experiences, preferences and beliefs. This knowledge not only gives them new ideas that help explain source text propositions, it also helps them discover what it is they think is most important about these propositions, which in turn leads to discovery of what it is they have to say on the topic as a whole.

Similarly, elaboration may promote critical thinking. Students use prior knowledge as a basis for comparison, a means of testing the validity of source text ideas. Such activity leads student to do more than simply accept what they read at face value. It provides them with a way to explore the implications of ideas, to find their strengths and weaknesses, to evaluate their usefulness in real-world situations. It enables them to draw inferences and analogies, to see ideas from a variety of perspectives, which well may influence the perspective they choose to take when they write.

Finally, we see elaboration's crucial influence on the process of representation building. The representation students build of the source text while reading contains not only propositions from that text, but also from memory. Some of this information may be "shared" in the sense that it is derived from a common base of gists from the

source text and common experiences in the world at large (for example, the "second wind" metaphor). Even so, the representation itself is highly individualized, containing each student's own unique ideas, perspectives, beliefs, values, personality traits, interests and style. Eventually, this representation becomes, to one extent or another, the basis for the student's own text. As students plan their own texts, making decisions about what it is they want to say, they will be selecting material from a personalized pool of ideas, one that does not contain all ideas from the source text, and does contain specialized, already developed approaches to evaluating ideas.

Thus we see evidence of elaboration's potential to shape the thinking processes that support the process of reading-to-write. Unfortunately, in the protocols we saw, relatively little of that potential was exploited. Most of our participants wrote papers that were essentially summaries with response. In other words, they did little more than restate a source text idea, and then give their own response to it. As the transfer rating shows, such responses, when they did transfer, were more likely to be low-level, localized responses. Yet these papers do not reveal the depth of processing that elaboration led these students to engage in. As the protocols show, a good deal more thinking went on than is evidenced in these final products. But these students seemed not only unaware of the value of the material they generated via elaboration, but also of the value of the process of elaboration itself. Often we saw students taking tentative steps down the road to critical thinking or invention only to hesitate, turn back, or move on to the next paragraph. In some cases, it appeared that students simply devalued their own ideas. More often than not, however, it seemed that elaborative processing occurred without students' understanding or awareness of its effect on processing. As stated above, our students elaborated freely and spontaneously, but often automatically, without conscious control of the process. That this should be the case is not surprising, in that they have probably never been taught to be aware of this process.

The results of this study suggest that teaching students to be aware of the outcomes of elaborative processing might be of value. We think there is real promise in sharing the results of studies like this one directly with our students, to help them develop some metacognitive awareness of the functions of elaboration, the value of elaborative material they generate, and the impact of elaboration, directly and indirectly on the papers they write. This kind of awareness may teach students, first of all, to value their own ideas and experiences more, to bring themselves and their own beliefs into the domain of academic tasks. It may also help them to think more critically and inventively, to explore ideas and their ramifications, to move beyond summarizing to more analytic kinds of writing. Finally, metacognitive control of the process of elaboration will help students manage the process of reading-to-write better, since elaboration plays such an important role in this kind of task. Students must be encouraged to use what they already know purposefully and wisely in reading-to-write tasks if they are to succeed in them. Perhaps Suzie said it best when she got her first glimmer of metacognitive awareness:

> "You know what I just thought of...it seems that I'm making comparisons from my own knowledge to the knowledge that I'm reading--the knowledge of these people--the knowledge of Alan Lakein, William James, Walter Pauk...I'm using my own knowledge in comparison to theirs and using things that happened to me to try to understand what they're saying and it's working...I just realized this and that's kind of cool..."

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Appendix I

Notes

[1]Because raters were permitted to code an elaboration as serving more than one function (e.g., critical perspective *and* development), totals equal more than 100%. Reliability for these figures was as follows: For new ideas, .76; for critical perspective, .78; for development, .81. All reliability scores computed using the Cronbach's Alpha test for reliability amongst three raters.

[2]Reliability for this aspect of the rating was .59 using Cronbach's Alpha. It should be noted, however, that 67% of the disagreements found two raters in agreement and one in disagreement, and in these cases, 72% of the time the disagreement was over the difference between "some value" and "more value." That is to say, raters were not disagreeing about whether an elaboration had value or not; they were simply disagreeing about how much value it had.

[3]Reliability for this rating (again using Cronbach's Alpha) was .81.

[4]The fact that so little material transferred made further quantitative analysis difficult. I wanted to see, for example, if the function of an elaboration (e.g., critical perspective) or the amount of value it added contributed to the overall quality of an essay, or its length (since the amount of elaboration in an essay is often considered to be an indication of writing ability). However, the small amount of transfer made it difficult to establish whether or not such relations exist with any degree of certainty. Therefore, neither a correlational study, designed to connect functions and value of elaborations to quality of text, and a regression study, designed to see if function or value of elaboration could predict quality or length of essay, yielded significant results. This is not to say that such relations may not exist. Training students to use elaborations more effectively may be necessary to create a level of transfer sufficient to support this kind of analysis.